

# Anxiety disorders in children and adolescents

Aaron Vallance

Elena Garralda

## Abstract

This article summarizes various aspects of anxiety disorder in children and adolescents using the latest research findings. Anxiety is an emotion, an unpleasant feeling of tension or apprehension accompanied by physiological changes and worries or fears. It can become maladaptive if excessive or developmentally inappropriate; if it also causes significant functional impairment, it can be considered to be an anxiety disorder. The type of disorder depends on age of onset, the symptomatology, and the presence or not of a specific feared situation. Anxiety disorders are among the most prevalent categories of psychopathology in children. Making an early diagnosis is important; anxiety disorders may impede academic and social functioning. At least one-third of children with anxiety disorders meet the criteria for two or more anxiety disorders. General comorbidity with other psychiatric disorders is 40%. Various aetiological factors include: temperament, genetics, neurobiological changes, parent-child interactions, negative life events, and social adversity. The prognosis of anxiety disorders depends on several factors, including comorbidity, age of onset, severity at baseline and type of disorder. As well as psycho-education, evidence-based treatments include cognitive-behavioural therapy and, in more severe cases, medication such as selective serotonin-reuptake inhibitors. Other comorbid disorders need to be assessed for and treated as appropriate. Recent research has demonstrated the effectiveness of prevention strategies.

**Keywords** anxiety disorder; cognitive-behavioural therapy; education; panic; phobia; prevention; selective serotonin reuptake inhibitors

Anxiety is an emotion, an unpleasant feeling of tension or apprehension accompanied by physiological changes and worries or fears. It can become maladaptive if excessive or developmentally inappropriate; if it also causes significant functional impairment, it can be considered to be an anxiety disorder. Anxiety disorders

**Aaron Vallance** *MRCPSych* is Honorary Lecturer in Child and Adolescent Psychiatry, Imperial College London. His research interests include the placebo response. Conflicts of interest: none declared.

**Elena Garralda** *FRCPsych FRCOCH* is Professor of Child and Adolescent Psychiatry at Imperial College London, and Honorary Consultant Child and Adolescent Psychiatrist with Central and North West London Foundation NHS Trust, London, UK. Her research interests include psychosomatic problems in children and the interface between child and adolescent mental health services with general practice and paediatrics. Conflicts of interest: none declared.

## What's new?

- Increased emphasis on diagnostic criteria (based on ICD-10 classification)
- A new section on neurobiological and neuropsychological aetiological factors
- Updated information on prognosis
- Updated information on the use of medication
- A new section on prevention

are among the most prevalent categories of psychopathology in children and adolescents.

It is important to bear in mind developmental differences in the presentation of normal anxiety and anxiety disorders (Table 1). Increasing cognitive skill endows adolescents with the capacity to imagine and ruminate on increasingly complex and abstract threats. What is seen as normal for a young child may be considered a disorder in an older child.

## Diagnostic features

The common feature of anxiety disorders is a manifestation of anxiety symptoms. Diagnostically, some anxiety disorders (e.g. separation anxiety disorder) are specific to childhood, whereas others (e.g. agoraphobia) are not specific to children. The various types of anxiety disorder differ according to:

- the nature of symptoms
- age of onset
- epidemiological characteristics
- prognosis
- treatment.

Children with anxiety disorders show a range of symptoms, from mild worry and distress to overwhelming and incapacitating anxiety that interferes with functioning. The International Classification of Diseases, tenth revision (ICD-10), diagnostic criteria require the presence of several of a number of autonomic or physiological changes (examples include restlessness, increased sweating, shaking, a dry mouth, abdominal distress, chest discomfort, and palpitations) occurring either in a specific feared

## Fear: typical developmental stages

Age	Fears
9 months to 3 years	Separation, strangers
3–6 years	Animals, darkness, 'monsters'
6–12 years	Performance anxiety
12–18 years	Social anxiety
Adulthood	Illness, death

Table 1

situation (examples include: in public, in social situations, whilst travelling, by specific objects, and during separation from attachment figures) or for a specific duration (e.g. panic disorder, generalized anxiety disorder). Making an early diagnosis is important, particularly as many anxiety disorders remain untreated in the community, causing distress and impeding academic and social functioning. Failure to diagnose may interfere with the child's acquisition of social skills and result in social dysfunction. This article considers the diagnostic features of most of the common anxiety disorders.

**Separation anxiety disorder** is an excessive anxiety about separation from attachment figures or excessive worrying about the figure's welfare that is beyond that expected for the child's developmental level. Diagnosis requires severity of symptoms – defined in ICD-10 as 'severity that is statistically unusual' – or developmentally inappropriate anxiety, plus significant distress or impairment, such as refusal to go to school. ICD-10 diagnostic criteria includes an onset before the age of 6 years and a duration of at least 4 weeks.

**Generalized or over-anxious anxiety disorder** tends to occur in older children than those presenting with separation anxiety disorder. They display excessive worry and anxiety, which is generalized and persistent, and not restricted to any particular situation or object. This 'free-floating' anxiety is hard to control and is frequently accompanied by a more restricted set of somatic complaints than those found in adults, including restlessness, fatigue, muscle tension, and sleep disturbance. These children may show concerns about their competence, excessive self-consciousness, and a strong need for reassurance.

**Social phobia** involves the marked, persistent fear of humiliation and embarrassment in social or performance situations involving exposure to unfamiliar people or to scrutiny; these situations are then usually avoided, thereby reinforcing the anxiety associated with them. When confronted with a phobic situation (e.g. public speaking or going to a party) the adolescent will experience anxiety symptoms such as sweating and palpitations, and at least one of: blushing, shaking, or fear of vomiting, micturition, or defecation. If avoidance of the phobic situation becomes extreme, the adolescent may become completely socially isolated.

**Elective mutism** – the main feature is a failure to talk in specific social situations for at least four weeks. It may be seen as a type of social phobia.

**Panic disorder** involves recurrent and unexpected attacks of severe anxiety (panic attacks) that are not restricted to any particular situation (Table 2). Persistent apprehension about experiencing a future attack (anticipatory anxiety), worry about the implications of the attack or its consequences (e.g. losing control, having a heart attack), and behavioural changes related to the attacks are all typical.

**Specific or simple phobia** – in contrast to normal fears, which are common and developmentally appropriate, specific phobias are uncommon and cause significant distress or impairment. They can occur at any age and are characterized by excessive and unreasonable fears of clearly discernible, circumscribed objects or situations that provoke an immediate anxiety response. In children this may be manifested as crying, tantrums, freezing, or clinging. Adolescents may recognize that the fear is

## Panic attacks

**Characteristic symptoms:** a discrete period of intense fear or discomfort that develops acutely and is associated with multiple physical symptoms, including:

- palpitations
- sweating
- trembling
- shortness of breath
- chest pain
- nausea

Table 2

excessive, although this may not be the case with younger children. Particularly significant for medical practice are phobias of injections and medical procedures.

## Epidemiology

Anxiety disorders are one of the most prevalent categories of psychopathology in children and adolescents (Table 3). Sub-clinical symptoms of anxiety disorder are even more common, with more than 25% of non-referred children reporting sub-clinical symptoms and over 20% having sub-clinical phobias. Sex ratios are similar for the different sub-types. At least one-third of children with anxiety disorders meet the criteria for two or more anxiety disorders. General co-morbidity with other psychiatric disorders – including oppositional defiant disorder, major depression, hyperkinetic or attention deficit hyperactivity disorder, and substance abuse – is 40%. Muris *et al.*<sup>1</sup> found that 84% of their sample of children and adolescents with pervasive developmental disorders met the full criteria for anxiety disorder, with the most common diagnosis being simple phobia (64%).

## Aetiology

**Temperament** – longitudinal studies of psychopathology in anxiety disorders suggest that such conditions do not arise *de novo*; instead, they often involve pre-existing temperamental traits or tendencies. Children who are behaviourally inhibited in early childhood (showing fear and withdrawal in unfamiliar situations and high sympathetic reactivity), or who have an anxious-resistant attachment style, have comparatively high rates of anxiety disorders in later childhood and adolescence. Early temperamental traits of passivity and shyness in pre-school girls are also associated with subsequent anxiety.

**Genetics** – there is evidence from family and twin studies that genetic factors play a part in anxiety disorders. These disorders tend to run in families but with little specificity, except for panic disorder. Children's anxiety disorders often do not coincide with those of their parents, but instead overlap with other anxiety disorders and with depression. Children of depressed parents are as likely to have a psychiatric diagnosis as children of anxious parents, but those in the latter group are more likely to have pure anxiety disorder.

**Neurobiology/neuropsychology** – Pine<sup>2</sup> has constructed a neuropsychological model of childhood anxiety, whereby genetic

### Epidemiological characteristics of anxiety disorders in children and adolescents

Disorder	Prevalence	Age of onset	Sex ratio
Separation anxiety disorder	2–4%	Pre-puberty; peaks at 7 years	Approx. equal
Generalized anxiety disorder	3%	Increased incidence in adolescence	Approx. equal
Panic disorder	5%	Late teens	Approx. equal
Social anxiety disorder	1–7%	11–15 years	Commoner in girls
Specific phobia	2–4%	> 5 years	Equal

**Table 3**

and environmental factors combine to determine the neurobiological development of candidate brain areas, such as the amygdala and prefrontal cortex. Structural and functional neuroimaging studies, mostly in adults, have demonstrated amygdala-prefrontal circuitry abnormalities, areas well known for their role in memory, learning, and emotional regulation. Such biological changes are associated with information processing biases, namely threat attention, threat appraisal, and fear conditioning (Table 4). Such biases mutually interact to underlie the development of anxiety traits and disorder.

**Parent–child interactions** – retrospective and observational studies have found that parents of anxious children have an excess of controlling and/or rejecting styles of child-rearing, high ‘expressed emotion’ with emotional over-involvement towards their children. It is unclear, however, whether the parenting style contributes to the child’s anxiety, or vice versa. It is possible that parental behaviour of this type impedes the development of autonomy, so that the child feels less safe and more anxious. Parents with anxiety problems who feel threatened themselves may promote the perception of threat in these children and impede the development of coping skills; children may therefore develop anxiety problems via modelling.

**Catastrophic life events (threatening events and loss)** are clearly related to post-traumatic stress disorder. Other anxiety disorders may be related to adverse life events, particularly those characterized by threat or loss, such as the death of a family member or family break-up.

**Social adversity** – parents who are not exposed to social adversity are likely to be more emotionally available to their children than those in disadvantaged situations, and more able

to help contain their children’s anxieties and fears. However, parents’ emotional availability to their child is likely to be affected if their thoughts and feelings are focused on multiple social problems, leaving little emotional space for the child. Children living in families where the parents are facing chronic stressors such as overcrowding, poverty, and marital discord are more likely to experience insecurity and to feel anxious and fearful.

### Assessment

As for any child psychiatric disorder, a complete diagnostic assessment involves addressing the possible aetiological factors and comorbidity (which may not be evident initially), and seeking information from several perspectives (as reports of anxiety symptoms differ with informants, even when separate interviews and/or well-validated instruments are used).

Potential assessment errors include undiagnosed learning disability or failure to inquire about post-traumatic stress disorder. Autistic spectrum disorders should be considered if anxiety symptoms present in combination with social awkwardness, communication difficulty, and restricted pattern of interests. Medical assessment should include a thorough medical history and physical examination, particularly when physical symptoms are present, paying special attention to disorders that can mimic or provoke anxiety states (Table 5).

### Differential diagnosis

In making a diagnosis, it is important to bear in mind developmental differences in the presentation of anxiety disorders,

### Information processing biases: threat attention and threat appraisal

Process	What is it?	Bias in anxiety disorder	Relative specificity to anxiety disorder sub-categories
Threat attention	Attention is rapidly directed towards environmental threats	Tendency to allocate attention automatically towards threats As threat intensity increases, a tendency to avoid the threat develops	Low
Threat appraisal	Events are interpreted as meaningful and threatening to the individual	Children with anxiety disorders exhibit a reduced threshold for classifying stimuli as dangerous	High; for example, adolescents with social phobia exhibit a threat appraisal bias specifically for social stimuli

**Table 4**

### Disorders that can mimic anxiety states

- Hypoglycaemia
- Hyperthyroidism
- Cardiac arrhythmias
- Caffeinism
- Pheochromocytoma
- Seizure disorders
- Migraine
- Central nervous system disorders (e.g. temporal lobe epilepsy)
- Medication reactions<sup>a</sup>

<sup>a</sup>Medication reactions may be due to: antihistamines; anti-asthmatics; sympathomimetics; steroids; neuroleptics causing akathisia, specifically haloperidol and pimozide (neuroleptic-induced separation anxiety disorder); selective serotonin reuptake inhibitors; non-prescription drugs, including diet pills and cold remedies.

**Table 5**

sub-clinical anxiety symptoms, and transient, developmentally appropriate, fears. In addition to the medical conditions in Table 5, differential diagnosis needs to consider psychiatric diagnoses, which may present with a similar clinical picture or co-exist with anxiety disorders (Table 6).

### Psychiatric differential diagnoses and comorbidities

Diagnosis	Description
Oppositional defiant disorder	Characterized by a pattern of negativistic, hostile, and defiant behaviour; some children may exhibit oppositional behaviour only when anxious – in these cases the behaviour may improve with treatment of the anxiety
Attention deficit hyperactivity disorder	Typically characterized by three main features: impulsivity, hyperactivity, and inattention
Depression	Comorbid depression has been associated with older age, high levels of impairment and social anxiety, and poor long-term outcome in childhood anxiety disorders
Alcohol abuse	There is a familial association between alcoholism and anxiety disorders, and also a temporal relationship, as children with anxiety disorders are at increased risk of alcoholism in adolescence. Some anxious children/adolescents may use alcohol to reduce their anxiety symptoms
Post-traumatic stress disorder	Children with pre-existing anxiety are more vulnerable to the effects of trauma. Traumatized children may meet criteria for one or more other anxiety disorders

**Table 6**

### Prognosis

The prognosis of anxiety disorders depends on several factors, including comorbidity, age of onset, increased severity at baseline, and type of disorder.

Up to 80% of children with anxiety disorders go into remission in the first year of their illness, with the highest remission rates in separation anxiety disorder (almost all children) and the lowest in panic disorder (less than 75%) and in more severely affected children. Many children develop new psychiatric disorders at follow-up (often new anxiety disorders) and in adulthood. Data from a general population epidemiological study showed that different types of anxiety disorder in childhood predicted anxiety and other psychiatric disorders in adolescence; the only exception to this was generalized anxiety disorder, which predicted only conduct disorder.<sup>3</sup>

Although most adolescent anxiety disorders do not persist into adulthood, most adulthood disorders are preceded by an anxiety disorder in adolescence. Moreover, anxiety disorders of childhood lead to a 2–5-fold increase in anxiety disorders, depression, suicide attempts, and psychiatric admissions in later life. They are associated with increased rates of alcohol and substance abuse and smoking, possibly as a means of self-medicating. In adults, anxiety disorders are linked to an increased risk of academic failure, low-paid employment, dependence on state benefits, and reduced quality of life, and they account for a considerable proportion of all mental health costs.

### Treatment

Even though anxiety disorders are common in childhood, affected children often do not receive treatment. When it is available, treatment usually involves a multi-modal or combined approach, and may include components such as:

- psycho-education
- consultation with the child's general practitioner and school
- behavioural management
- cognitive-behavioural therapy
- medication
- family work or therapy
- psychodynamic psychotherapy.

The type of management offered will depend on the ever-evolving evidence base, as well as on the individual case. Patients with specific phobias are more likely to be offered behavioural treatment; associated comorbidity with family dysfunction may make a family approach more appropriate. The preference of the child and/or family and the resources available at the local clinic may also influence the choice of treatment. Although the National Institute for Clinical Excellence (NICE) developed national guidelines on anxiety disorders in 2004 and 2007, these currently pertain only to adults.

*The main principles of treatment* should include stress reduction, education about the nature of anxiety, improving coping mechanisms, and engagement of the family to help support changes. Parents may need to resolve their own problems related to separation and anxiety to avoid exacerbating the child's symptoms.

### Behavioural therapy and cognitive-behavioural therapy

Behavioural therapy models derive from (classical and operant) conditioning, social learning, and information processing

theories. Behaviour therapy can target the child's behaviour in the context of home and school. Specific techniques include:

- systematic desensitization and exposure for specific phobias, including school phobia
- relaxation training
- modelling of appropriate behaviour
- role playing
- rewards for desirable behaviour.

Cognitive-behavioural therapy (CBT) combines a behavioural approach (e.g. exposure) with cognitive techniques (e.g. positive self-statements) aimed at altering cognitions and behaviour. The child is asked to reframe his or her thoughts in a more positive way, which in turn alters behaviour. Children aged 10 years and above can benefit from cognitive techniques. Various books, such as the *Think Good, Feel Good* series, provide accessible cognitive-behavioural material for the clinician and patient alike.<sup>4</sup> A recent meta-analysis by Ishikawa *et al.*<sup>5</sup> of various clinical trials demonstrated the efficacy of CBT in childhood anxiety disorders. The authors found relatively little difference in effect size between short (fewer than ten sessions) or long CBT, and between group or individual CBT; this might have implications for cost-effectiveness.

### Other individual psychotherapies

Psychodynamic psychotherapy focuses on underlying fears and anxieties, relating then to past experiences. Although a strong evidence base is lacking, a prospective outcome study and a retrospective case review documented good outcome in a number of children, especially those who underwent more sessions, were younger, and had phobic symptoms.

### Family therapy

If the child's symptoms are seen as a sign of family dysfunction, family therapy may work with the family to help change dysfunctional patterns of interaction and thus reduce the child's anxiety symptoms.

### Pharmacotherapy

Medication can be used in children, although rarely in isolation. It is more commonly an adjunct to a comprehensive package of care, including psychological techniques for symptom management, as this may help prevent relapse after medication has been discontinued. The neurobiology of anxiety is complex, and involves multiple neurotransmitter and neuro-endocrine systems. Medication should be considered in older children and adolescents with more severe symptoms, bearing in mind side-effect profiles and comorbidity.

**Antidepressants** are the most commonly prescribed medication for anxiety disorders, although there is a smaller evidence base in children than in adults. Tricyclic antidepressants have previously been prescribed, but selective serotonin reuptake inhibitors (SSRIs) are now favoured due to better side-effect profiles and the fact that they are relatively safe in overdose. Fluoxetine and fluvoxamine have been shown to be effective in the treatment of children and adolescents with social phobia, generalized anxiety disorder, and separation anxiety disorder.<sup>6</sup> In one small study, sertraline was found to be effective and well tolerated in generalized anxiety disorder.<sup>7</sup>

In studies of depressed children and adolescents, SSRIs have been associated with suicidal ideation and non-fatal acts, and the Medicines and Healthcare products Regulatory Agency (MHRA) and NICE in the UK have therefore recommended that fluoxetine only be prescribed for depression, on the basis that this drug has a favourable risk-benefit profile. It is uncertain, however, what the risk of such side effects is in a non-depressed sample, although it is important to be mindful of the frequent comorbidity of anxiety with depression. In the UK, no antidepressants are licensed for the treatment of children with anxiety disorders, but fluvoxamine and sertraline are licensed for use in children with obsessive-compulsive disorder. The evidence base and consequent guidelines regarding the use of antidepressants in children are ever evolving, and the reader is urged to consult the latest reports.

**Benzodiazepines** – although case reports indicate that benzodiazepines can be helpful, double-blind controlled trials have failed to demonstrate efficacy. Benzodiazepines can also cause behavioural disinhibition and their use is therefore not recommended as primary treatment of young people with anxiety disorders.

**Other medication** – there are few data on  $\beta$ -blockers for anxiety disorders in children. Case reports and open trials have shown a reduction in anxiety symptoms after buspirone treatment, although it can also be associated with disinhibitory reactions and worsen aggression in children.

### Treatment of co-morbid anxiety disorders

The guiding principle behind treating children and adolescents with comorbid anxiety disorders is to treat both. Quite often the comorbid condition requires attention first as it can impair the ability of the child or adolescent to make use of strategies for anxiety management.

### Prevention

Given the high prevalence rates and negative consequences of anxiety disorders, as well as the clinical and public concerns over the use of medication, cost-effective prevention measures would be a welcome strategy. Prevention interventions are well placed to target multiple risk factors simultaneously; this is important given the complex interplay between risk factors and the multiple pathways of development for psychological disorders. Farrell and Barrett<sup>8</sup> have reviewed current practice in prevention research in anxiety and depressive disorders, and described an evidence-based cognitive-behavioural programme run in Australian schools.

### Conclusion

Anxiety disorders in children and adolescents are relatively common, can be very disabling, and may persist into later life. The paediatrician or general practitioner may be the first professional to have contact with affected children. It is therefore important for all professionals who deal with children and adolescents to be aware of possible manifestations of anxiety in this age group. Early differentiation between anxiety symptoms and anxiety disorder facilitates appropriate mental health referrals for further assessment and treatment, enabling the child or adolescent to return to normal functioning. ♦

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